Prevalence of medication therapy adherence in the elderly and related factors

Prevalência de adesão à terapêutica medicamentosa em idosos e fatores relacionados

Prevalencia de la adhesión al tratamiento farmacológico en ancianos y factores relacionados

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ABSTRACT

Objective: to determine the prevalence of adherence to medication therapy in elderly outpatients; to verify whether there is an association between medication therapy adherence and demographic and socioeconomic factors, health conditions. **Method**: a quantitative, exploratory, descriptive, cross-sectional study, performed in outpatient clinics of a university hospital in Rio Grande do Sul, Brazil. Three data collection instruments were answered by a convenience sample of 107 elders. A descriptive and inferential statistical analysis was conducted. **Results:** the prevalence of adherence was 86.9%. A statistically significant association was identified between the adherence variable and receiving medical guidelines on how to take medications, and having adverse reactions. **Conclusion:** Nurses must know the prevalence of medication adherence and related factors in order to plan interventions that promote therapeutic success.
Key words: Elderly; Medication Adherence; Prevalence; Ambulatory Care; Nursing.

RESUMO

Objetivo: verificar a prevalência de adesão à terapêutica medicamentosa entre idosos em atendimento ambulatorial e se há associação entre tal adesão e fatores demográficos, socioeconômicos e condições de saúde. **Método:** estudo exploratório, descritivo, transversal, quantitativo, realizado nos ambulatórios de um hospital universitário no Rio Grande do Sul, Brasil. Participaram 107 idosos, selecionados por conveniência, que responderam a três instrumentos de coleta de dados. Realizou-se análise estatística descritiva e inferencial. **Resultados:** a prevalência de adesão foi de 86,9%. Houve associação estatisticamente significante entre a variável adesão e receber orientações do médico sobre como fazer uso dos medicamentos e apresentar reação adversa. **Conclusão:** é importante que os enfermeiros conheçam a prevalência de adesão aos medicamentos e os fatores a ela relacionados para melhor planejamento de intervenções que promovam o sucesso terapêutico.
Descritores: Idoso; Adesão à Medicação; Prevalência; Assistência Ambulatorial; Enfermagem.

RESUMEN

Objetivo: determinar la prevalencia de la adhesión a la medicación entre los pacientes ancianos en atención ambulatoria y si hay asociación entre la adhesión y las condiciones demográficas, socioeconómicas y de salud. **Método:** estudio transversal exploratorio, descriptivo, cuantitativo realizado en clínicas de consulta externa de un hospital universitario del estado do Rio Grande do Sul, Brasil. En total, fueron seleccionados 107 ancianos por conveniencia y estos respondieron a tres instrumentos de recolección de datos. Hubo análisis estadístico descriptivo e inferencial. **Resultados:** la prevalencia de la adhesión fue 86,9%. Hubo asociación estadísticamente significativa entre la variable adhesión y recibir consejo médico sobre cómo hacer

uso de la medicación y presentar reacción adversa. **Conclusión:** es importante que los enfermeros conozcan la prevalencia de la adhesión a la medicación y los factores relacionados con ella para mejor planificación de intervenciones que promuevan el éxito terapéutico.

Palabras clave: Anciano; Adhesión a la Medicación; Prevalencia; Atención Ambulatoria; Enfermería.

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INTRODUCTION

A major problem for elderly people who need to use routine medications to treat chronic health conditions and prevent disability is related to treatment adherence. Among the elderly, barriers cited to adherence to prescribed medication include factors such as: cognitive, sensory and motor deficits; financial difficulties; lack of support from family; beliefs and negative attitudes towards medications[1].

The adherence concept varies among different authors. In general, adherence is understood as the use of at least 80% of a prescribed therapy (medications or other procedures), observing schedules, dosage and duration of treatment[2]. The level of adherence to medication therapy in the elderly, found in national and international studies, ranges from 28% to 88.5%[3-5]. This great variability may be due to the different methodologies used to assess adherence.

Adherence to prescribed treatment is essential for the successful treatment of the elderly, and is an important component of health care. In elderly, non-adherence to prescribed medication increases the likelihood of therapeutic failure and unnecessary complications, leading to greater health system spending due to a higher number of consultations and hospitalizations, as well as a higher prevalence of disability and premature death[6-7].

Because it is a multidimensional phenomenon with sociocultural implications, treatment adherence manifests itself in a particular way in different population groups according to geographic location, habits, health conditions, organization of health care services, among other characteristics[8]. The promotion of medication adherence among the elderly requires time and effort, in order to evaluate the variables that can affect this behavior.

Research on adherence, and related factors in the elderly, conducted in Brazil, remains incipient, because studies referring to this subject are focused on specific diseases, such as diabetes[9], bipolar disorder[10] and hypertension[5]. However, the elderly usually have multiple comorbidities, and studies on adherence to medication therapy in these cases are scarce.

Non-adherence to medication therapy by the elderly is a human response that involves a potentially negative risk to their health, and can affect not only their lives, but also those of their family, community and society[11]. Therefore, nurses must know the adherence of the elderly to prescribed medications, and the factors related to this behavior for planning appropriate interventions. Thus, the questions that guided this study were: What is the prevalence of adherence to medication therapy in the elderly in ambulatory care? Is there an association between demographic, socioeconomic, and health conditions and medication adherence in these elderly?

The objectives of this study were to determine the prevalence of medication therapy adherence among elderly in ambulatory care; to verify whether there is an association between adherence to medication therapy and demographic and socioeconomic factors, and health conditions.

METHOD

This was an exploratory, descriptive, cross-sectional, quantitative study, conducted in outpatient clinics of angiography, cardiology, pulmonology; endocrinology, gastroenterology and urology at a university hospital (UH) in a city in Rio Grande do Sul, Brazil. These clinics were selected due to the high number of elders in therapeutic follow-up.

The study population consisted of elders in outpatient care. The inclusion criteria were using the UH ambulatory care and taking at least one medication, for at least 15 days before the day of the interview; the exclusion criteria were being treated with chemotherapy or radiotherapy, due to the specific characteristics of these treatments which can interfere with medication adherence; having surgery in the 15 days prior to data collection, due to a possible motivation for the elder to regularly use prescribed medications during the surgical procedure recovery period; presenting with rambling speech that would prevent adequate response to the research instrument questions.

The sample was estimated using the formula for an infinite population: $n = [(Z\alpha / 2) 2. P.Q]/E2$, in which: n = sample size; $Z\alpha$ = standard deviation significance level; P = prevalence of the disorder in health; Q = supplementary prevalence (1-P); E = sample error. The parameters used were based on a national study of the elderly [9]: $Z\alpha$ = 95% significance level; P = prevalence of elderly adherence of 50%; and a sampling error of 10% was adopted. The sample included 116 elders, according to the sample size obtained of n=96, and adding 10% to control for confounding factors, and 10% for losses. The convenience sample was selected consecutively, according to the criteria of inclusion and exclusion mentioned above. The final sample consisted of 107 elders, as nine instruments were discarded due to incomplete answers.

The data were collected using structured interviews conducted with three instruments, in November of 2013. To characterize the elderly with regard to demographic, socioeconomic and behavioral factors, health conditions and medication treatment, an instrument developed by the researcher was used, which was evaluated by two gerontology professors,

for face and content validity. Changes on some issues were suggested by these professors. After these alterations, the instrument was administered to ten elderly people, for face validity. The instrument was considered adequate, with no perceived inadequacies. The interviews conducted at this stage were not used in the final sample.

The Mini Mental State Examination (MMSE) was used for cognitive screening of the elders. A version of the MMSE validated in Brazil was administered. The cutoff point used to indicate cognitive impairment was 13 points for illiterate respondents, 18 for low to medium levels of education (up to eight years), and 26 points for those with more than eight years of education [12].

The Measure of Treatment Adherence (MTA) instrument was used to verify the adherence of the elders to medication therapy. This instrument consists of seven items, and the answers are in the form of a Likert scale, with scores ranging from 1 = always to 6 = never. The answers to each of the items are summed, and the final value is divided by the total number of items. The resulting value is converted to a dichotomous scale, developed to indicate subjects with or without to medication treatment adherence. The MTA values between 1-4 are considered "non-adherence to treatment", and the values between 5-6 are considered "adherence". This instrument was developed and validated in Portugal[13], and was adapted into Brazilian Portuguese and validated in a study with patients on anticoagulant therapy[14].

Each elder was approached in the outpatient waiting room by an interviewer before or after physician consultation. Prior to the interview, the elder was informed about the research and consent was requested. Those who agreed to participate signed, or used his fingerprint to indicate signature, the Terms of Free and Informed Consent form. The collection of data was performed by members of the Study and Research Group on Geriatrics & Gerontology, Nursing/Health and Education (PEG-GERON) who have received specific training.

A spreadsheet was developed in the Microsoft Excel 2007 program to organize the data, containing a dictionary (*codebook*) and two spreadsheets used for validation by double entry (typing).

Data analysis was performed using the Statistical Package for the Social Sciences® (SPSS) software, version 20.0. A descriptive statistical analysis was performed with absolute and relative frequencies and measures of central tendency (median) for categorical variables, and dispersion measures (25th percentile = P25 and P75 = 25th percentile) for numeric variables.

The Kolmogorov-Smirnov test was applied to verify the normality of the numerical data. The data did not show a normal distribution; therefore the descriptions of variables were performed from the median. The Mann-Whitney test was used for variables with two categories, and the Kruskal-Wallis test for variables with more than two categories to compare medians.

To verify the association between the adherence variable (yes or no) and the other dichotomous variables, the chi-square test was used for expected frequencies greater than five, and the Fisher's exact test for expected frequencies below

five. The correlation between MTA and numeric variables was analyzed using the Spearman's Rho correlation coefficent. A 5% significance level was established. The data are presented in tables.

The research project was submitted to the Research Ethics Committee of a university in southern Brazil, and obtained a favorable opinion. The authorization to perform the study was requested from the hospital management. After approved, a contact was made with the individual responsible for the clinics to explain the purpose of the project and how the data collection would occur.

RESULTS

Characteristics of the elderly regarding adherence

Among the 107 elders investigated, 93 (86.9%) showed a MTA value greater than or equal to 5, and were considered adherent to the prescribed medication therapy. The median of the adherent elders for the MTA was 5.42, and for the non-adherent was 4.71; 50% of elders exhibited MTA values between 5.14 (P25) and 5.71 (P75).

Characteristics of the elderly regarding demographic and socioeconomic factors

Participant ages ranged from 60 to 83 years. The median age of the elders who were adherents to the prescribed medication therapy was 66 years, which was lower than that of non-adherent elders, which was 72.5 years (P25 = 63 and P75 = 72). The median educational level of the adherent elders was four years, which was higher than that of non-adherent elders, which was 3.5 years (P25 = 3 and P75 = 8). No statistically significant correlation was identified between the MTA value and the variables of age (ρ = -0.115; p = 0.238) or years of study (ρ = 0.080; p = 0.411).

Table 1 shows the prevalence of adherence to medication treatment according to demographic and socioeconomic factors, and the p-value obtained in the test of association. None of the demographic and socioeconomic variables presented in Table 1 showed a statistically significant association with the adherence variable.

Table 1 – Prevalence of adherence to medication treatment in elderly outpatients according to demographic and socioeconomic factors, Rio Grande do Sul, Brazil, 2013

Demographic and socioeconomic factors	Adherence		*p* value
	Yes n (%)	No n (%)	
Sex			
Female	64 (86.5)	10 (13.5)	1.000*
Male	29 (87.9)	4 (12.1)	

To be continued

Table 1 (concluded)

	Yes	No	
Skin color			
White	83 (86.5)	13 (13.5)	1.000[*]
Non-white (black and mixed race)	10 (90.9)	1 (9.1)	
Marital status			
With partner	55 (85.9)	9 (14.1)	0.714[**]
Without partner	38 (88.4)	5 (11.6)	
Living situation			
Lives with companion	76 (86.4)	12 (13.6)	1.000[*]
Lives alone	17 (89.5)	2 (10.5)	
Occupation			
Does not have paid employment (retirees, housewife, pensioners)	78 (85.7)	13 (14.3)	0.689[*]
Has paid employment	15 (93.8)	1 (6.2)	
Income[***]			
Up to 3 times the minimum wage	78 (84.8)	14 (15.2)	0.596[*]
More than 3 times the minimum wage	8 (100.0)	0 (0.0)	
Can afford to buy the medication			
Yes	79 (88.8)	10 (11.2)	0.248[*]
No	14 (77.8)	4 (22.2)	
Has family support or hired care, if necessary			
Yes	80 (88.9)	10 (11.1)	0.231[*]
No	13 (76.5)	4 (23.5)	

Notes: * Fisher's exact test; ** Chi-square test; *** Minimum wage at the time of data collection = R $ 672.00.

Characteristics of the elderly regarding health conditions

Regarding the health self-assessment among the elderly, ten (9.3%) considered it bad; 52 (48.6%), regular; and 45 (42.1%), good. The median MTA for the self-assessment of health variable increased as the assessment made by the elderly in relation to their health was improving, constituting a statistically significant association using the Kruskal-Wallis test (H = 9.527, df = 2, p = 0.009). Those who found a poor, fair, and good health showed, respectively, a median of 5.28, 5.42 and 5.57.

The median number of consultations/year among adherent elders was four, corresponding to half of the number of consultations/year of non-adherent elders, which was eight (P25 = 3 and P75 = 7). No statistically significant correlation was identified between the MTA value and the number of consultations/year variable (ρ = -0.106; p = 0.282).

According to Table 2, the most prevalent chronic conditions in the sample were arterial hypertension, present in 85 (79.4%) elderly, and diabetes mellitus, present in 61 (57.0%). No chronic health condition was associated with the adherence variable (all those occurring in at least 10% of the sample were tested).

The elderly who had osteoporosis and depression showed lower median MTA scores than those without these diseases, and such differences were statistically significant (p = 0.009 and p = 0.047 respectively). Elders with hypertension and dyslipidemia presented lower median MTA scores compared to those without these conditions, but this result was not statistically significant (p = 0.300 and p = 0.054 respectively). However, the result for dyslipidemia was borderline, which may be due to the small sample size (Table 2).

Among the elderly interviewed, 14 (13.1%) showed results suggestive of cognitive impairment on the MMSE. No association between adherence and the MMSE result was identified (Table 2). However, elderly patients with results suggestive of deficits had lower median adherence compared with those who did not.

Table 2 shows the prevalence of adherence to medication treatment according to the reported chronic conditions (those for which the elders received a medical diagnosis at some

Table 2 - Prevalence of adherence to medication treatment, and median of Measure of Treatment Adherence, according to reported chronic conditions and Mini-Mental State Examination in elderly outpatients, Rio Grande do Sul, Brazil, 2013

Variables	Adherence		p value	Median	p value
	Yes n (%)	No n (%)		Measure of Treatment Adherence	
Arterial Hypertension					
Yes	72 (84.7)	13 (15.3)	0.292[*]	5.42	0.300[***]
No	21 (95.5)	1 (4.5)		5.49	

To be continued

Table 2 (concluded)

Diabetes Mellitus					
Yes	52 (85.2)	9 (14.8)	0.555**	5.42	0.466***
No	41 (89.1)	5 (10.9)		5.42	
Pulmonary disease					
Yes	11 (84.6)	2 (15.4)	0.678*	5.42	0.878***
No	82 (87.2)	12 (12.8)		5.42	
Heart disease					
Yes	38 (80.9)	9 (19.1)	0.100**	5.42	0.702***
No	55 (91.7)	5 (8.3)		5.42	
Osteoporosis					
Yes	30 (81.1)	7 (18.9)	0.233*	5.28	0.009***
No	63 (90.0)	7 (10.0)		5.49	
Arthritis / rheumatism					
Yes	19 (86.4)	3 (13.6)	1.000*	5.42	0.519***
No	74 (87.1)	11 (12.9)		5.42	
Dyslipidemia					
Yes	23 (76.7)	7 (23.3)	0.061*	5.28	0.054***
No	70 (90.9)	7 (9.1)		5.42	
Thyroid Problems					
Yes	13 (92.9)	1 (7.1)	0.688*	5.42	0.944***
No	80 (86.0)	13 (14.0)		5.42	
Depression					
Yes	9 (81.8)	2 (18.2)	0.635*	5.28	0.047***
No	84 (87.5)	12 (12.5)		5.42	
Mini-Mental State Examination					
Normal	81 (87.1)	12 (12.9)	1.000*	5.43	0.518***
Suggestive of deficit	12 (85.7)	2 (16.7)		5.33	

Notes: * Fisher's exact test; ** Chi-square test; *** Mann-Whitney test.

point in life, and for which they were in treatment when the interview was performed) and MMSE, the p-value obtained in the test of association, the median MTA for the variables, and the p-value related to the Mann-Whitney test.

Characteristics of the elderly regarding factors related to the health system, health professionals and medication therapy

Table 3 shows the prevalence of medication treatment adherence by the elderly, according to factors related to the health system, health professionals and the medication therapy and the p-value obtained in the test of association.

Table 3 – Prevalence of adherence to medication treatment in elderly outpatients, according to factors related to the health system, health professionals and medication therapy, Rio Grande do Sul, Brazil, in 2013

Factors related to adherence	Adherence		p value
	Yes n (%)	No n (%)	
Supplementary coverage			
Yes	23(88.5)	3(11.5)	1.000*
No	70(86.4)	11(13.6)	
Access to health services when needed			
Yes	70(76.9)	10(71.4)	0.737*
No	21(84.0)	4(16.0)	

To be continued

Table 3 (concluded)

Access to all medications free of charge			
Yes	44(88.0)	6(12.0)	0.755**
No	49(86.0)	8(14.0)	
Received physician´s guidance about medications			
Yes	90(89.1)	11(10.9)	0.029*
No	3(50.0)	3(50.0)	
Received nurse´s guidance about medications			
Yes	22(88.0)	3(12.0)	1.000*
No	71(86.6)	11(13.4)	
Satisfied with the health care received			
Yes	81(86.2)	13(13.8)	1.000*
No	12(92.3)	1(7.7)	
Had adverse reactions			
Yes	32(78.0)	9(22.0)	0.035**
No	60(92.3)	5(7.7)	
Considers their treatment complicated			
Yes	14(73.7)	5(26.3)	0.125*
No	79(89.8)	9(10.2)	
Understand the information on the labels and package inserts of medications in use			
Yes	52 (91.2)	5(8.8)	0.058*
No	31 (77.5)	9(22.5)	

Notes: * Fisher's exact test; ** Chi-square test; *** Did not answer this question, illiterate elder or visually impaired

The variables "receiving medical guidelines on how to take the medicines" and "having adverse reaction" showed a statistically significantly association with adherence (p = 0.029 and p = 0.035, respectively) (Table 3).

The median number of medications/day used by adherent elderly was four, which was lower than those used by non-adherent elders, which was five (P25 = P75 = 3 and 7). No statistically significant correlation was identified between the MTA value and the number of medications/day variable (ρ = -0.100 and p = 0.307).

DISCUSSION

The prevalence of adherence to medication prescribed in this study of the elderly was 86.9%. A similar result was found in a study with elderly in outpatient care in Campinas/SP, where the prevalence of adherence was 88.5%[3]. The high prevalence of adherence found in this study may be related to the fact that these elders were monitored in the ambulatory setting.

The findings regarding the demographic and socioeconomic profile of the elders in the present study corroborate the findings of other studies on adherence conducted with elderly people in Brazil [3,6,9-10]. The demographic and socioeconomic variables investigated did not show a statistically significant association with adherence, although a relationship between

race, marital status, occupation, education, income, age, family and social support and medication adherence has been found in other studies[6-7,10].

In this study, the adherent elders had a lower median age than non-adherent elders, but this result was not statistically significant. A study conducted on elderly hypertensive patients in the United States identified the age equal to or greater than 75 years was a predictor of non-adherence to medication[15]. Elderly with advancing age may have cognitive deficits and decreased functional capacity that can contribute to non-adherence to medication[6,11].

The median of the educational level variable was higher among adherent compared to non-adherent elderly, but this result did not show statistical significance. A higher level of education can promote understanding of elders about their health condition and their medical treatment, favoring adherence[16].

For the health self-assessment variable, the MTA median increased as the assessment made by the elderly in relation to their health improved, constituting a statistically significant association. A study conducted on elderly in Belo Horizonte/MG, Brazil, showed that a lower perception of health status and higher number of consultations/year were related to underuse of medications for financial reasons[6].

Elderly with worse health conditions and more appointments tend to get more prescriptions and may not take the medications, because they cannot afford to purchase them[6]. In this study, the median number of consultations/year among adherent elders was half that of the non-adherent elders, but this result was not statistically significant.

In relation to chronic health conditions, hypertension and diabetes mellitus were the most prevalent. One study with elderly patients with hypertension in Ribeirão Preto/SP, Brazil, indicated a prevalence of medication adherence of 28%[5]. A study with elderly diabetics in Recife/PE, Brazil, found a prevalence of 52.4%[9]. In this study, among the 85 hypertensive elderly, 72 (84.7%) were adherent and of the 61 diabetics, 52 (85.2%) were adherent.

Elderly with osteoporosis had lower median MTA scores than those without it, and such difference was statistically significant. One study conducted in the United States with older people with osteoporosis found that dissatisfaction with medical visits, lack of knowledge about the disease and how to use the medications, and forgetfulness were reasons leading to lower medication adherence[17].

Elderly people with depression also had lower median MTA scores than those who did not have this condition, and this result was statistically significant. Studies in the United States found that the presence of depressive symptoms was

associated with non-adherence to medication in elderly patients with hypertension and diabetes mellitus[18-19].

Depression is a common condition in older people, and may compromise adherence to medication for the treatment of other chronic health conditions which may be present. It is important that nurses and other health professionals investigate the presence of depressive symptoms in the elderly, as they can be treated, encouraging medication adherence[18].

The MMSE was applied in order to verify whether the cognitive state interfered with adherence, as studies reported an association between the presence of cognitive impairment and non-adherence to medication in the elderly[6,16]. Although the elderly with a result suggestive of cognitive impairment have shown a median adherence lower than those without such a deficit, there was no association between adherence and the result of the MMSE.

Regarding the variables related to the health system or healthcare professionals, receiving "physician's guidance about medication" showed a statistically significant association with adherence. One study with elderly cardiac patients, conducted in the United States, found that receiving guidance about medications from a health professional is a facilitator of adherence[20]. Patients with more knowledge about the prescribed medication, as well as the behaviors required for follow-up treatment, appear to be more likely to adhere to medication than those with less information[5,10].

Receiving "nurse´s guidance about medication" was not associated with adherence. Nurses were present and performing nursing consultation in which the elderly received guidance about medications in only one of the six clinics in which the data from this study were collected. The presence of nurses in all the clinics, performing nursing consultations and health education activities, could help the less adherent elders. In ambulatory clinics where the data were collected, a pharmacist was not available. The nurse and the pharmacist are essential professionals for guidance and strengthening adherence, but were scarce in the studied reality.

In this study, the variables "extra coverage", "access to health services", "access to medications through the health system" and "satisfaction with health care" were not associated with adherence. These variables have been used in other studies with the elderly, and were associated with adherence[6,16-17].

As for factors related to medication therapy, the variable "having an adverse reaction" showed a statistically significant association with adherence. In this study, the prevalence of adherence decreased in the presence of adverse reaction. The experience of adverse effects, or fear of having these, can lead the elderly to be nonadherent to medication treatment[3,10,16-17,20].

Adherence was lower in those elderly who felt that the treatment was complicated compared to those who did not think so. The complexity of the therapeutic regimen may lead to non-adherence by requiring more attention, memory and organization of the elderly confronted with the medication administration schedules[21]. In this study, the "finding the treatment complicated" variable was not associated with adherence.

Adherence was also lower among the elderly who, when they read the labels and package inserts for medications they were using, did not understand the information. This may be due to technical language used on medication labels and package inserts.

The median number of medications/day used by adherent elders was lower than those used by non-adherent elders, but this result was not statistically significant. Studies indicate that the use of multiple medications leads to difficulty with adherence, and can increase the likelihood of adverse effects and the complexity of the therapeutic regimen[10,21].

CONCLUSION

The method employed favored the achievement of objectives. The prevalence of adherence to medication therapy for elders in outpatient care was 86.9%. A statistically significant association was found between the adherence variable, and the "received physician's guidance about medications" and "had adverse reaction" to some of the medications used variables.

Elderly people with osteoporosis or depression showed lower median adherence, in the MTA, than those who did not have these conditions. As the self-assessment of health by the elderly improved, the median adherence increased, according to the MTA. All these associations were statistically significant.

The consecutively selected convenience sample can be a limitation of this study.

The main implication for nursing resulting from this study is that all factors associated with adherence in this sample can be modified. Identification of the prevalence of adherence, and factors related to it for each elder, enables the development of more specific actions to promote the correct use of medicines. Proper monitoring of medication therapy aids in the control of chronic conditions and health maintenance.

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